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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/553,644

10/14/2005

Shan Wan

128346.60801

1449

7590 02/13/2008  
Pepper Hamilton  
500 Grant Street, 50th Floor  
Pittsburgh, PA 15219

EXAMINER

JOHNSON, KEVIN M

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

02/13/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/553,644	<b>Applicant(s)</b> WAN, SHAN	
	<b>Examiner</b> KEVIN M. JOHNSON	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 December 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Status***

1. The amendment submitted on 12/19/2007 is accepted by the examiner. Claims 1-4, 9-11, 16 and 21 are currently amended. New claims 22-23 are added.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1, 16 and 21 have been considered but are moot in view of the new ground(s) of rejection.

The amendment changes the scope of the claims because the original language of claim 2, "the abrasive layer is sintered with a high pressure high temperature process" is directed to the layer undergoing a sintering process, but the amendment to claim 1 where the "abrasive layer comprises at least one of sintered polycrystalline diamond or sintered cubic boron nitride" refers to the structure of the abrasive layer.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Corrigan et al. (US 5855996).

Claims 1-23 are directed to a tool insert, comprising an abrasive layer and a substrate, and the process of making the insert. The abrasive layer is located on the substrate and has a sum value of an impact resistance number greater than or equal to 19,000. The abrasive layer comprises at least one of sintered polycrystalline diamond (PCD) or sintered cubic boron nitride (CBN) where PCD-to-PCD or CBN-to-CBN bonding is exhibited. The abrasive layer comprises a bimodal powder of abrasive crystals, where both the coarse and fine particles have a size standard deviation of less than six-tenths of the average particle size. The average size ratio of fine particles over coarse particles is about 0.22, and the average aspect ratio is greater than about 0.5. A volume fraction of fine particles is between 15% and 70% and the volume fraction of coarse particles is between 30% and 85%. The abrasive layer has at least 93 vol.% diamond content.

Corrigan teaches an abrasive PCD compact supported on a metal carbide substrate. The abrasive PCD layer is a mixture of relatively large sized diamond particles dispersed in fine sized diamond particles. The fine sized particles account for 2-15% of the total diamond particles, and range in size from 0.01 to 1 micron. The coarse particles range from 5 to 100 microns (column 5, line 57 - column 6, line 5). The

aspect ratio of the particles may be seen in figure 1A, where the particles appear to be largely spherical. A high temperature high pressure process is used to effect the sintering, intercrystalline direct bonding, of the diamond particles forming the PCD compact in to an essentially void free compact and the direct bonding of the compact to the adjacent support layer (column 6, lines 45-51). The resultant PCD compacts exhibit shear strength and impact properties improved over similar compacts that utilize only one diamond particle size (column 4, lines 45-53).

Corrigan fails to teach that the tool insert exhibits an abrasion resistance number greater than or equal to 19,000 or that the fine particle to coarse particle size ratio is 0.22.

It would have been obvious to one skilled in the art at the time of the invention that the material taught by Corrigan would have an abrasion resistance number greater than or equal to 19,000, and that a void free material made entirely of PCD would have a diamond content of at least 93 vol.%. One would also recognize that the aspect ratio of the particles utilized by Corrigan would be greater than 0.5, as the particles seen in fig. 1A are largely spherical. It would have been further obvious to one skilled to use an average size ratio of fine particles over coarse particles of 0.22.

One would have been motivated to make such a modification through the process of routine optimization of the porosity of the abrasive layer.

***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEVIN M. JOHNSON whose telephone number is (571)270-3584. The examiner can normally be reached on Monday-Friday 7:30 AM to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KMJ

/Jerry A Lorengo/  
Supervisory Patent Examiner, Art Unit 1793